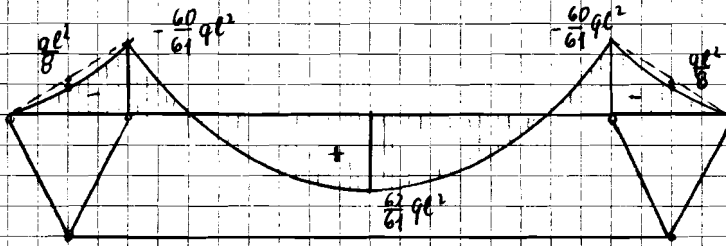


Bauwerk I + II

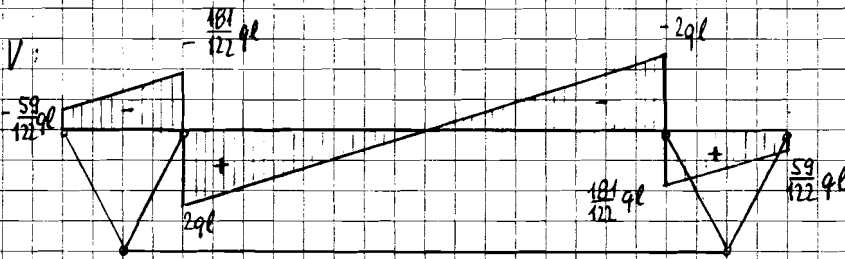
Lösung der Spannungsprüfung

Herbst 07

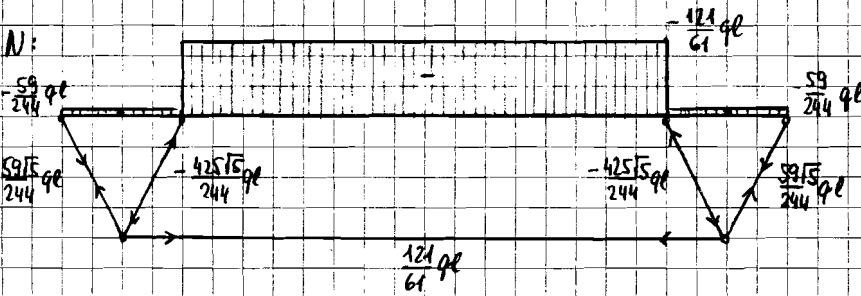
1 a) M:



V:



N:

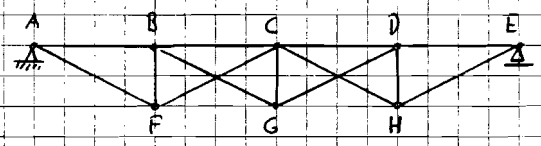


b) $P_0 = \frac{62}{61} ql$

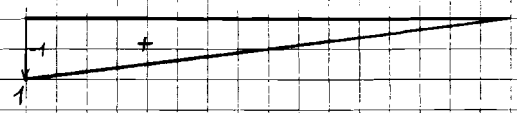
2a) $q_k = \frac{4M_k}{l^2}$

b) $q_k = 3.323 \frac{M_k}{l^2}$

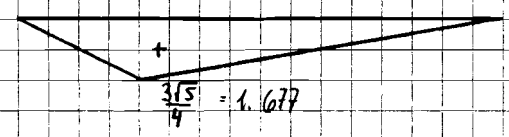
3.1.



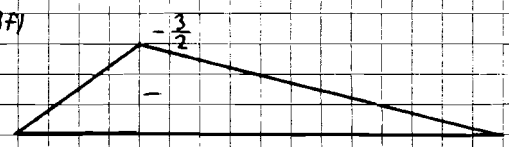
a) η_N :



b) $\eta_{N(C-F)}$:

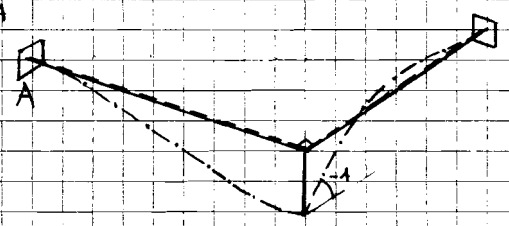


c) $\eta_{M(B-F)}$:

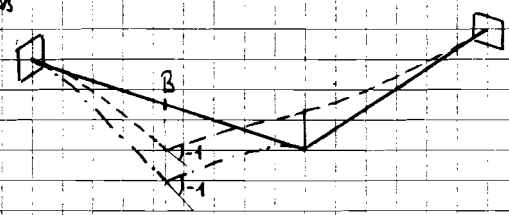


3.2.

a) η_{T_A} :

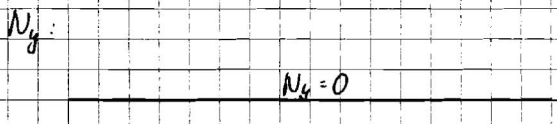
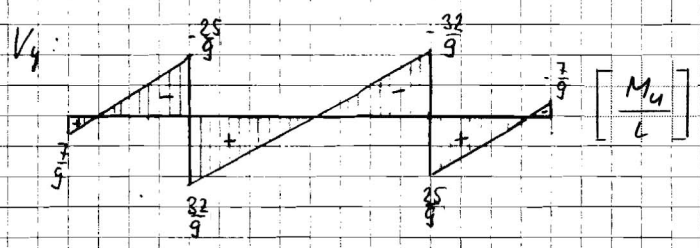
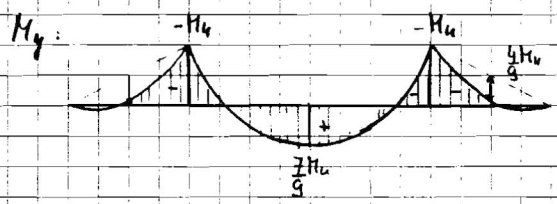


b) $\eta_{T_{B5}}$:



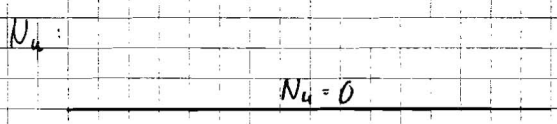
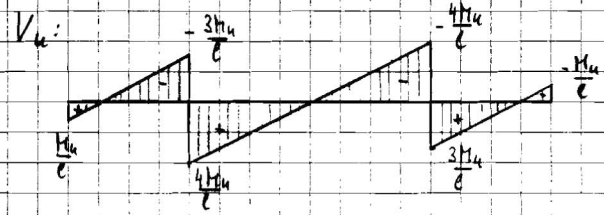
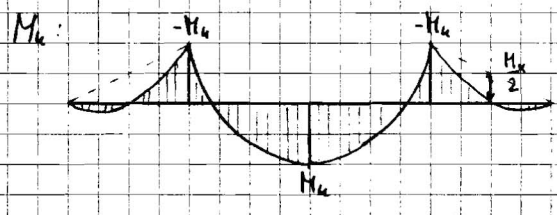
--- $EI/GK = 0$
 - - - $EI/GK = \infty$

4 a) $q_g = \frac{32}{9} \frac{M_u}{l^2}$ (Flusslast)



$w_g = \frac{13}{54} \frac{M_u l^2}{EI}$

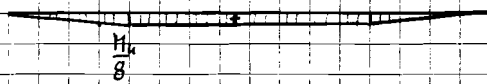
6) $q_u = \frac{4M_u}{l^2}$ (Traglast)



$w_u = \frac{1}{3} \frac{M_u \cdot l^2}{EI}$

c) $M_{res}(Stütz) = \frac{M_0}{8}$ (Endlastung)

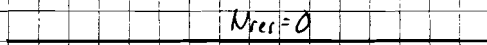
M_{res} :



V_{res} :



N_{res} :



$w_{res} = \frac{M_0 l^2}{16 EI}$

5 a) $u_0 = \frac{Q \cdot l^3}{3EI}$

→ mit BI = quadrat Parabel, $\alpha = \frac{u_1}{u_0}$

b) $u = \frac{Q l^3}{3EI(1 - \frac{29ql^3}{\pi^2 EI})} - ql^3$ (Vianello)

b) $u = \frac{Q l^3}{3EI(1 - \frac{139ql^3}{24 EI})}$ (Vianello)

c) $q_{cr} = \frac{3\pi^2 EI}{l^3(6 + \pi^2)} \approx 1.866 \frac{EI}{l^3}$ (Vianello)

c) $q_{cr} = \frac{24 EI}{130 l^3} \approx 1.846 \frac{EI}{l^3}$ (Vianello)

c) mit DGL: $q_{cr} = 1.872 \frac{EI}{l^3}$ (exakte Lösung)

6 a) $w = \frac{2Ql^2}{3EI}$

b) $Q_u \approx \frac{128 M_u}{65 l}$ aus UGV-Satz

c) $Q_u = \frac{63 M_u}{32 l}$ aus OGV-Satz